

SHIP SYSTEM Hull Structure	SUBSYSTEM	MRC CODE R-	
SYSTEM	EQUIPMENT	RATES GS-11/12	M/H
MAINTENANCE REQUIREMENT DESCRIPTION 1. SEMAT Assessment procedure for: a. GRP structural bulkheads, decks (12011) b. GRP trunks, enclosures (12322) c. GRP shell, supporting structure (11021) d. GRP superstructure/fittings (15011) e. GRP doors, hatches, scuttles and manhole covers (16711,16812, and 16721). f. GRP mast structure (17011). g. GRP Stack and Mack structure (16211). 2. Conduct SEMAT Assessment Procedure for GRP vertical ladders. 3. Conduct SEMAT Assessment Procedure for GRP inclined ladders and handrails.		TOTAL M/H ELAPSED TIME	
SAFETY PRECAUTIONS 1. Forces afloat comply with NAVOSH Program Manual for Forces Afloat, OPNAVINST 5100.19 series. 2. Comply with ship/shore regulations for working aloft. 3. Forces afloat comply with NAVOSH Program Manual for Forces Afloat, OPNAVINST 5100.19 series.			
TOOLS, PARTS, MATERIALS, TEST EQUIPMENT		PAGE 1 OF 10	
MATERIALS 1. [1144] Tag, safety 2. [1609] Magnifier 3. [3187] Ruler, plastic, 6" TOOLS 1. [0461] Gage, thickness, 3" feeler, 26-blade, 1/4" tip 2. [0603] Hammer, hand, Machinist's ball peen, 8 OZ 3. [0864] Mallet, rawhide, Type 3, class 1, 11 OZ 4. [1350] Tape, measuring, 3/8" steel, 100 FT, hand crank 5. [1792] Knife, pocket, 3" snap-blade, marlinspike, and shackle 6. [2271] Flashlight, Type 3, style 1, explosive proof MISCELLANEOUS 1. Ships drawings (as required) 2. MHC51 Class Guidance for Repairs and Alterations (S-9100-AF-SRM-010/MHC51 Class)			
DISTRIBUTION STATEMENT D Distribution authorized to DOD components and DOD contractors only; critical technology; April 1998. Other requests for this document shall be referred to Naval Sea Systems Command (SEA 04TD). Destroy by any method that will prevent disclosure of contents or reconstruction of the document.		48	
LOCATION		DATE April 1998	
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TOOLS, PARTS, MATERIALS, TEST EQUIPMENT (Contd) NOTE: Numbers in brackets can be referenced to Standard PMS Materials Identification Guide (SPMIG) for stock number identification.	
PROCEDURE NOTE 1: Accomplish assessment before availability, after availability, and before deployment. Preliminary a. Obtain a copy of ship's Compartment and Access plan to assist assessment. b. Obtain a copy of ship's Repair Inspection Requirements (RIR) sheets for reference during this assessment. c. Review JSNs from the ship's CSMP for discrepancies to be assessed under these procedures. 1. Conduct SEMAT Assessment Procedure for GRP Structures a. Conduct a visual assessment of GRP structures aboard ship. Assessment shall include but not be limited to the following: (a). GRP structural bulkheads, decks (b). GRP trunks, enclosures (c). GRP shell, supporting structure (d). GRP superstructure/fittings (e). GRP doors, hatches, scuttles and manhole covers (f). GRP mast structure (g). GRP stack and mack structure Assess for the following: NOTE 2: When performing assessment, pay particular attention to hard spots (in areas of sudden changes of thickness or abrupt ending of stiffeners) where localized stress concentrations may occur. NOTE 3: When performing assessment, pay particular attention to areas around openings cut in a laminate. These areas should be assessed for cracks, failures and delaminations. These areas may have increased thickness incorporated and the edges either covered with a glass tape or a metal channel to prevent such damage. NOTE 4: Assessment of doors, hatches, scuttles and manhole covers shall be limited to GRP closure panels. The assessment of the supporting frame and structure and alignment shall be conducted in accordance with SEMAT MRC Assessment Procedure for Structural Closures.	
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PROCEDURE (Contd)

- (1) Deflections or deformations in grp supporting structures.
- (2) Cracks, fractures and delaminations.
- (3) Cracked or chipped paint or abrasion of the surface.
- (4) Unusual build-up or presence of moisture, oil or rust.
- (5) Structure that appears blistered or bubbled and feels soft to the touch.
- (6) Surface and penetrating cracks, open fractures and exposed fibers.
- (7) Gouges
- (8) Debonding of joints

NOTE 5: Refer to figures 1 - 7 for examples of GRP damage.

- b. Surface defects (cracks, edge delamination, etc) discovered during visual assessment should be further evaluated by Probing as follows:

- (1) Use a knife or a ruler to provide further indication of the physical dimensions and characteristics of surface defect. For tight cracks, a feeler gage can be used.

NOTE 6: An apparent crack along the surface may actually be the edge of a much larger delamination.

- (2) Measure and record the location, physical dimensions and description of all defects noted.

- c. Suspected areas of delamination and debonding should be further evaluated by Hammer Sounding as follows:

- (1) Sounding involves striking the area of concern repeatedly with a hammer. A mallet or small ball peen hammer can be used effectively.
- (2) Undamaged regions should be sounded to establish a contrast between damaged and undamaged laminate. Make sure the contrast in sound is not due to physical features of the structure such as a stiffener on the far side. Undamaged laminate produces a dull sound when struck while debonded or delaminated areas tend to ring out louder. By placing your hand on the surface adjacent to the area being struck, it is possible to feel the damaged laminate vibrate when struck.

NOTE 7: Hammer sounding becomes less effective as the depth of damage exceeds 1" or when the structure being assessed is highly loaded, i.e. restrained from vibrating.

- (3) Measure and record the location, physical dimensions and description of all defects noted.

- d. Report all discrepancies identified on applicable SEMAT discrepancy reporting forms (2-K or Material Assessment Form).

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PROCEDURE (Contd)

2. Conduct SEMAT Assessment Procedure for GRP Vertical Ladders.

- a. Assess connections securing ladder to structure for soundness.
- b. Assess ladder for cracks and breaks, for loose, missing or damaged fasteners.

NOTE 8 : Three slip resistant treads/slip-resistant deck coverings with no space between should be installed on deck at the head and foot of ladders, except where foot of ladder enters an engineroom bilge, on access hatch or scuttle or if non-skid deck grating or non-skid deck covering is installed.

- c. Assess non-slip treads on ladder and non-slip deck treads and/or non-skid deck covering on deck at head and foot of ladder for punctures, tears, loss of adhesion, bubbles, excessive wear, or loss of slip-resistance, as applicable.
- d. Record the location and description of all defects noted.
- e. Report all discrepancies identified on applicable SEMAT discrepancy reporting forms (2-K or Material Assessment Form).

3. Conduct SEMAT Assessment Procedure for GRP Inclined Ladders and Handrails.

- a. Assess ladders, handrails, and stanchions for cracks and breaks, and for loose, missing, or damaged fasteners.
- b. Assess for loose connections of treads and handrail stanchions to ladders.

Note 9 : Bottom connections on inclined ladders should be such as to allow for relative movement between decks. Slip joints, guide channels, or other similar features providing controlled rather than rigid restraint should exist.

- c. Assess ladder-to-deck connections for soundness.

NOTE 10 : Hand chains should not be taut, but just tight enough to provide safe handrail and loose enough to allow proper operation of open-eye snap hook.

- d. Assess ladders and handrails (or chains or manropes) to ensure there are no loose, missing, and damaged parts. Check especially for loose connections of treads and handrail stanchions to ladders, and damaged links, shackles, and snap-hooks on handchains, if any are installed.

- e. Assess ladder treads for wear.

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PROCEDURE (Contd)

NOTE 11: Three slip resistant treads/slip-resistant deck coverings with no space between should be installed on deck at the head and foot of ladders, except where foot of ladder enters an engineroom bilge, on access hatch or scuttle or if non-skid deck grating or non-skid deck covering is installed.

- f. Assess non-slip treads and/or non-skid deck covering for punctures, tears, loss of adhesion, bubbles, excessive wear, or loss of slip-resistance, as applicable.
- g. Record the location and description of all defects noted.
- h. Report all discrepancies identified on applicable SEMAT discrepancy reporting forms (2-K or Material Assessment Form).

4. The tables listed below identify the original construction materials for the MHC-51 Class.

NOTE 12: The original materials used in fabricating the MHC-51 Class Ships shall be used in repairs and alterations. Where this is impractical, equivalent materials shall be used following the guidelines in NAVSEA S-9100-AF-SRM-010/MHC51 Class.

TABLE I

Original Construction Materials			
Material Type	Weight (g/m ²)	Resin:Glass Ratio	PLY Thk (MM)
DF1400	1370	1:1 +/- 10%	1.8
Rovimat 1200	1200	0.85:1 +/- 10%	1.3
Mat 450	450	2.5:1 +/- 10%	1.1
Unitape 980	980	0.85 +/- 10%	1.1

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TABLE II

APPLICABILITY TABLE			
Structural Component	DF1400	RM1200	Thickness
Hull	X		52mm - 169mm
Watertight Bulkheads			
Below Mn Dk	X		17mm - 23mm
Above Mn Dk	X		13mm
Gen WT Blkhds	X		13mm
Hull Dks	X		17mm - 38mm
Deckhouse Main Blkhds		X	13mm - 21mm
Deckhouse Decks		X	14mm
Misc Blkhds FT & AT	X	X	3.5mm
Stepped Angle Connections			
Blkhds/Shell	X		17mm - 20mm
Blkhds/Deck	X		13mm
Mchry Craddles	X		19mm - 52mm

NOTE 13 : The fasteners attaching equipment, foundations, and outfitting to the GRP structure have been shock qualified for specific design loads. The fasteners employed are non-magnetic and include through bolts, self-tapping screws and threaded inserts. The self-tapping screws and bolts are CRES Grade 316. The self-tapping screws are ANSI B18.6.4 Type B and range in size from #8 to 5/16" and the threaded inserts range from 1/4" to 3/4".

NOTE 14 : Standard Navy repair kits can be obtained from SPCC Mechanicsburg under NSN 2090-00-372-6064, Type I is the complete repair kit. These kits conform to MIL-R-19907, "Repair Kit, Glass Reinforce Plastic Laminate".

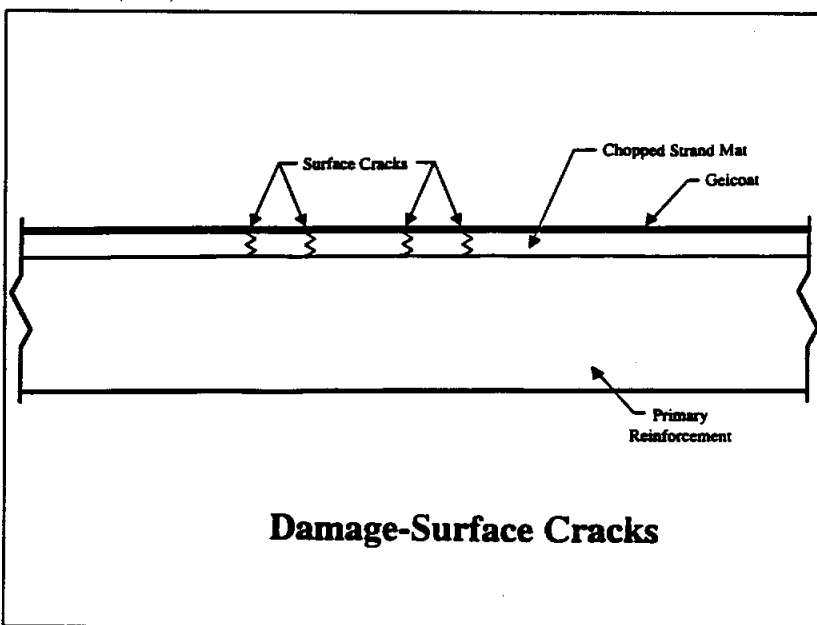


FIGURE 1

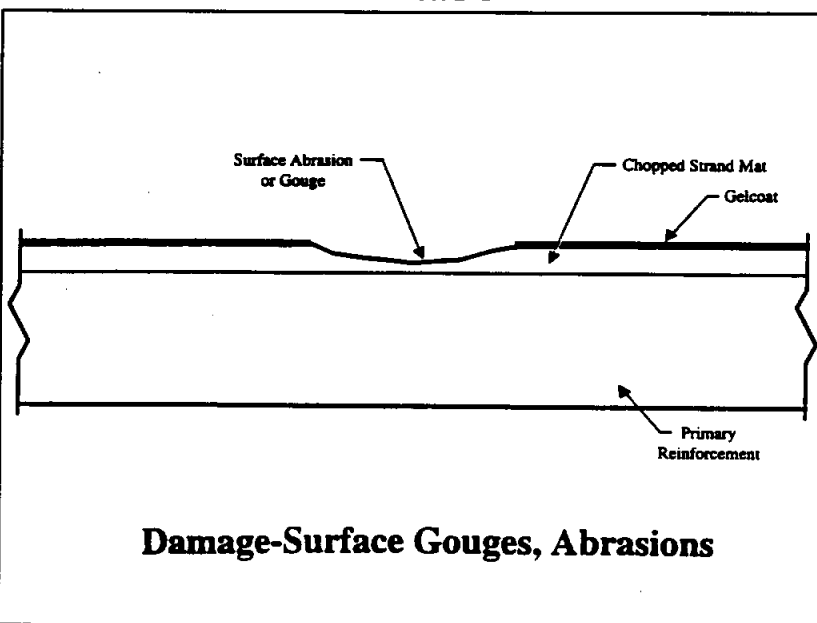


FIGURE 2

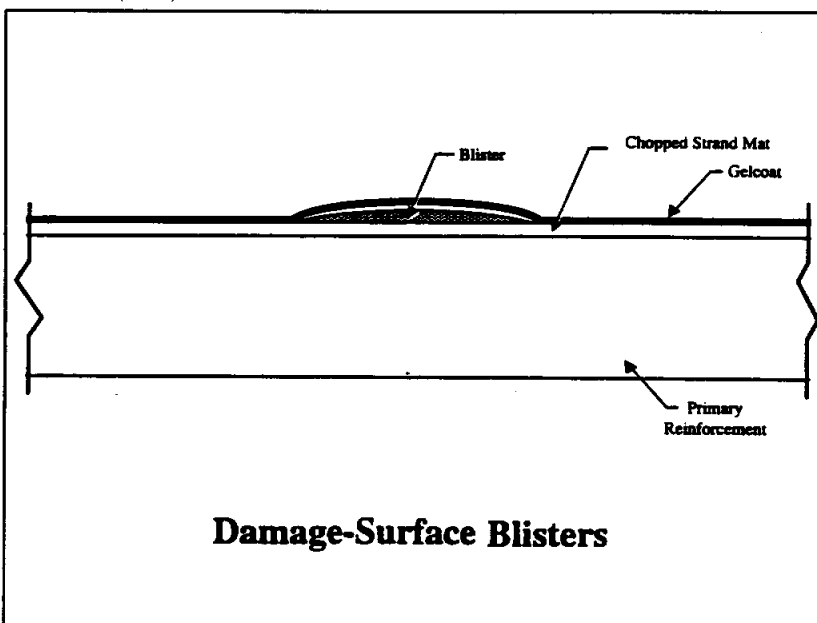


FIGURE 3

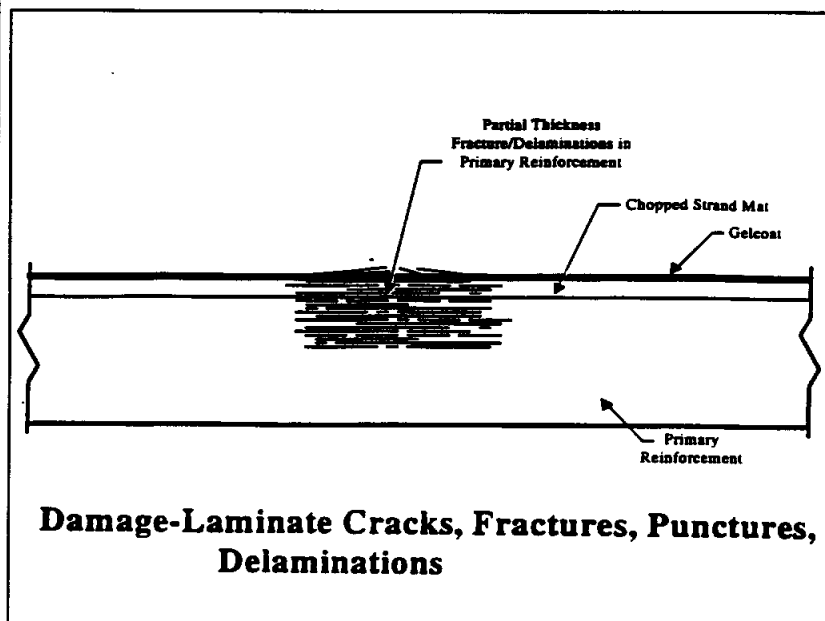
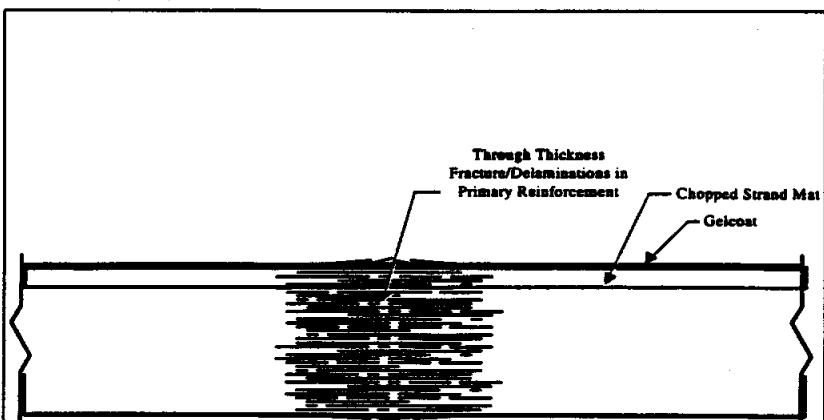
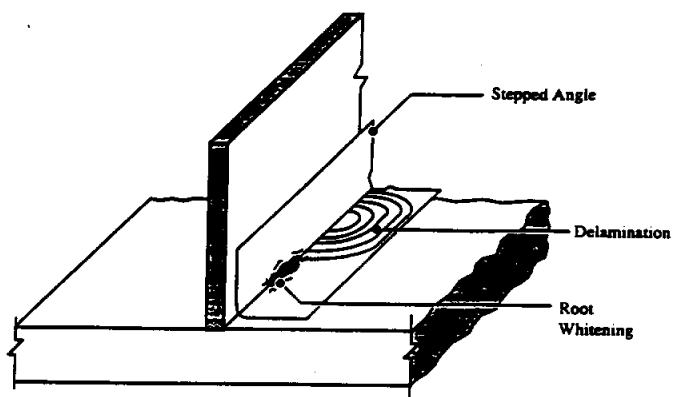


FIGURE 4



Damage-Laminate Cracks, Fractures, Punctures, Delaminations

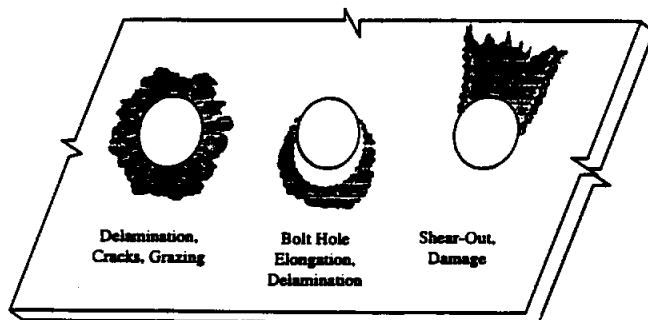
FIGURE 5



Damage - Stepped Angle Connection

FIGURE 6

PROCEDURE (Contd)



Damage - Laminate in Way of Mechanical Fasteners

FIGURE 7

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